

REBUTTAL TESTIMONY OF

ARTHUR SEKI

DIRECTOR
TECHNOLOGY DIVISION
ENERGY SOLUTIONS & TECHNOLOGY DEPARTMENT
HAWAIIAN ELECTRIC COMPANY, INC.

Subject: Utility Support for Renewable Energy
Development, Discussion on
Renewable Energy Technologies, and
Summary and Update of Policies and
Incentives for Renewable Energy
Development

INTRODUCTION

1

2 Q. Please state your name, position and business address.

3 A. My name is Arthur Seki, Director of Technology at Hawaiian Electric Company,
4 Inc. ("HECO"). My business address is 820 Ward Avenue, Honolulu, Hawaii.

5 Q. Have you previously submitted testimony in Docket No. 03-0371?

6 A. Yes. I submitted direct testimony, HECO T-2, on the general subject of renewable
7 energy.

8 Q. What will your rebuttal testimony cover?

9 A. My rebuttal testimony will cover the following subjects concerning renewable
10 energy and distributed generation ("DG"):

- 11 1) Utility support for renewable energy development;
12 2) Discussion on renewable energy technologies; and
13 3) Summary and update of policies and incentives for renewable energy
14 development.

15

16 UTILITY SUPPORT FOR RENEWABLE ENERGY DEVELOPMENT

17 Q. Does HECO, Hawaii Electric Light Company, Inc. ("HELCO") and Maui Electric
18 Company, Limited ("MECO") support renewable energy development in Hawaii?

19 A. Yes. HECO, HELCO and MECO have in the past and will continue in the future
20 to support renewable energy development in Hawaii.

21 Q. Can you summarize some of the past renewable energy activities the utilities have
22 been involved in?

23 A. Yes. Some of the past renewable energy activities were:

- 24 • HECO participated in the MOD-OA and MOD-5B wind turbine
25 demonstrations at Kahuku. Commercial wind farms eventually were

1 developed at this site and other sites on the Big Island;

2 • HELCO operated and maintained for seven years the Hawaii Geothermal
3 Project 3 MW power plant on the Big Island. A commercial geothermal
4 power plant was developed near this site; and

5 • HECO was a partner for a 40 MW Ocean Thermal Energy Conversion (OTEC)
6 project at its Kahe power plant, however, the financing was never acquired by
7 developers.

8 Q. Do the Companies have strategies to increase renewable energy development in
9 Hawaii?

10 A. Yes. As stated in HECO T-2 and Exhibit-201, HECO, HELCO and MECO have
11 strategies to increase renewable energy development in Hawaii. The strategies
12 are:

- 13 • Pursue commercially available renewable energy generation in the near term
14 (including activities that can increase the number of intermittent renewable
15 energy technologies [e.g., wind, etc.] on the electric grid); and
16 • Invest in research, development and demonstration for emerging technologies
17 and resources that are not currently commercially available or economically
18 viable in the near term.

19 Q. Can you provide some examples of pursuing commercially available renewable
20 energy generation?

21 A. Some examples of pursuing commercially available renewable energy are:

- 22 • Maintain the existing commercial renewable energy projects;
23 • Pursue and facilitate new commercial renewable projects;
24 • Formation of a non-regulated subsidiary, Renewable Hawaii, Inc., to seek
25 passive investment opportunities in cost-effective, commercial renewable

1 energy projects in the State; and

2 • Examine renewable energy in the Integrated Resource Planning process.

3 Q. Can you provide examples of how you maintain existing renewable energy
4 projects?

5 A. Some examples of maintaining existing renewable energy projects are:

6 • The existing 1.5 MW HELCO-owned run-of-river Puueo hydroelectric plant
7 will be rehabilitated. The Public Utilities Commission (“PUC”) approved
8 HELCO’s plans to rehabilitate the damaged generator by installing a modern,
9 more efficient turbine generator with a capacity of roughly 2.28 to 2.4 MW;

10 • The Lalamilo wind farm is an existing 2.28 MW HELCO-owned facility
11 located in the Waimea area (Big Island). HELCO is presently considering
12 options for increasing the output of this facility;

13 • Puna Geothermal Venture has a 30 MW contract and has expressed an interest
14 in negotiating for an additional 6.5 MW of geothermal generated electricity.
15 On September 2, 2004, HECO sent a letter asking them to fill out a Non-
16 Utility Generator form and for the staffs on both sides to meet to discuss their
17 proposal; and

18 • Hawaiian Commercial & Sugar has a biomass (bagasse) power plant and a 12
19 MW firm power purchase agreement (“PPA”) with MECO. The initial term of
20 the PPA was through December 31, 1999 (and year to year thereafter), and the
21 parties subsequently agreed that the PPA will expire no earlier than December
22 31, 2007.

23 Q. Can you provide examples of how you pursue and facilitate new renewable energy
24 projects?

25 A. Some examples of pursuing and facilitating new renewable energy projects are:

- 1 • HECO, HELCO, and MECO receive and evaluate proposals from independent
2 power producers seeking to sell power to the utilities:
 - 3 ○ Apollo Energy Corporation is proposing to repower its existing 7,000
4 kW Kamao'a Wind Farm located at South Point, Hawaii. Under the
5 plans, the repowered wind farm would increase in size to 20,500 kW. On
6 October 13, 2004, HELCO and Apollo signed a PPA for as-available
7 energy from the repowered wind farm. HELCO will submit the PPA to
8 the PUC for approval;
 - 9 ○ Hawi Renewable Development LLC ("HRD") and HELCO signed a PPA
10 on December 30, 2003 for as-available energy from a 10,560 kW wind
11 farm at Hawi, Hawaii, which the PUC approved. (The PUC had
12 approved an earlier signed PPA between HELCO and Hawi Renewable
13 Development, Inc. for as-available energy from a 5,280 kW wind farm at
14 Hawi, Hawaii. HRD decided to construct and operate a 10,560 kW wind
15 farm, which would incorporate the original 5,280 kW wind farm at the
16 same site.);
 - 17 ○ Kaheawa Wind Partners ("KWP") has proposed to develop a 30 MW
18 wind farm on conservation land at Kaheawa Pastures, Maui. MECO is
19 currently in negotiations with KWP for a PPA for as-available energy
20 from this wind farm; and
 - 21 ○ Makila Hydro is planning to refurbish a 500 kW as-available hydro
22 source located at Pioneer Mill, Maui to provide as-available energy.
23 MECO is actively working on the project, including performing an
24 interconnection requirements study.

25 Q. What is the function of Renewable Hawaii, Inc. ("RHI")?

1 A. HECO formed a non-regulated subsidiary in December 2002 called RHI to seek
2 passive investment (providing a reasonable return on its investment) opportunities
3 in cost-effective, commercial renewable energy projects in the State. With initial
4 approval to invest up to \$10 million, RHI's formation builds on HECO's ongoing
5 commitment to increase Hawaii's use of renewable energy. The primary
6 objectives of RHI are to stimulate the addition of cost-effective, commercial
7 renewable energy in Hawaii, promote viable projects that will integrate positively
8 with the utility grid, and encourage renewable energy generation activity where
9 such is lacking in targeted categories (technologies requiring research and design,
10 prototype development, or demonstration will not be considered). RHI is
11 attempting to stimulate the renewable energy market by releasing a series of
12 island-specific Renewable Energy Request for Project Proposals ("RE RFPP").
13 The following summarizes RHI's efforts thus far:

14 • Island of Oahu

15 A RE RFPP for the island of Oahu was released on May 22, 2003 and closed
16 on August 22, 2003. Eight proposals were received with three proposals
17 passing the screening process and currently undergoing detailed evaluation.

18 • Maui County (islands of Maui, Molokai, and Lanai)

19 A RE RFPP for the islands of Maui, Molokai, and Lanai was released on
20 September 4, 2003 and closed on December 4, 2003. Five proposals were
21 received; two proposals passed the screening process and are currently
22 undergoing detailed evaluation.

23 • Big Island of Hawaii

24 A RE RFPP for the Big Island of Hawaii was released on January 22, 2004 and
25 closed on April 22, 2004. Four proposals were received; one proposal passed

1 the screening process and is currently being evaluated.

2 Q. What are the next steps for RHI?

3 A. RHI will review and evaluate the proposals. If the proposals are deemed feasible
4 and viable for RHI passive, equity investments, then RHI will seek appropriate
5 agreements with the proposers.

6 Q. What are the next steps for the proposers?

7 A. After the proposers have signed agreements with RHI, the proposers will obtain
8 the appropriate permits and approvals from various government agencies and
9 enter into negotiations for a PPA with the utility, which is subject to PUC
10 approval.

11 Q. How is commercial renewable energy technology examined in the Integrated
12 Resource Planning (“IRP”) process?

13 A. HECO, HELCO and MECO conduct long-range planning to meet the energy
14 needs of its customers. As part of its IRP process, HECO, HELCO and MECO
15 evaluate both supply-side and demand-side resource options. Included in the IRP
16 process is a comprehensive assessment of renewable energy resources and
17 technologies that are feasible in the near-term (within the 5-year action plan
18 period) and long term (over the 20-year IRP horizon). The evaluation of near-
19 term technologies yields the most up-to-date information on potential renewable
20 projects in Hawaii.

21 Q. What are some of the renewable energy technologies being examined in the
22 current IRP process?

23 A. Some of the renewable energy technologies are: dedicated biomass to electricity;
24 municipal solid waste; windfarms; photovoltaic; geothermal; run-of-river-hydro;
25 pumped storage hydro; and battery energy storage systems.

DISCUSSION ON RENEWABLE ENERGY TECHNOLOGIES

Q. What is your definition of feasible and viable?

A. As discussed by Mr. Seu in HECO T-1, with respect to the definition of feasible and viable, "In order for a form of DG to be 'feasible and viable for Hawaii', it must be

- 1) Technically feasible;
- 2) Commercially available;
- 3) Economically viable (i.e., cost-effective versus other options);
- 4) Price competitive in the long-term;
- 5) Sustainable in the long-term; (i.e., backed up by adequate infrastructure support with respect to operation and maintenance and fuel);
- 6) Able to address site-specific constraints (e.g., with respect to permitting);
- and
- 7) Able to meet the perceived needs of customers."

Q. Can you summarize what the Consumer Advocate ("CA") stated in their direct testimony on renewable DG technologies being considered on the mainland?

A. Yes, a brief description of commercial and research and development stage technologies follows:

- Small hydro was popular in the past, but has not been pursued lately. Federal regulation has made it difficult to develop and small hydro is cost prohibitive;
- Wind turbines are more prevalent, but require a large footprint located away from the general population for safety and noise concerns;
- Photovoltaics ("PV") are developed in the southwestern part of the United States and small PV is used in off-grid applications;

- 1 • Biomass generating projects are usually associated with water treatment
- 2 facilities, wood wastes or other biological waste;
- 3 • Compressed air storage is at the research and development stage and is very
- 4 site specific; and
- 5 • Geothermal has not proven reliable in Hawaii and is very site specific.

6 Q. Can you summarize what the Hawaii Renewable Energy Alliance (“HREA”) stated in their direct testimony on renewable DG technologies?

8 A. Examples of renewable energy DG are: wind turbines; biomass cogeneration; hydroelectric; photovoltaics, fuel cells; and pumped storage hydro

10 Q. Can you summarize what the Life of the Land (“LOL”) stated in their direct testimony on renewable DG technologies?

12 A. LOL reviewed numerous articles that evaluate cost and benefits of renewable energy.

14 Q. Can you summarize what the County of Maui (“COM”) stated in their direct testimony on renewable DG technologies?

16 A. COM made general statements that DG technologies are cost-effective in Hawaii. The renewable technologies include technologies like wind and solar energy. Off-site renewable energy includes wind and biomass. On-site renewable energy includes biomass (bagasse), photovoltaic, solar thermal electric and use of biomass or other waste materials.

21 Q: Can you summarize your direct testimony on renewable DG technologies?

22 A. As mentioned in HECO T-2, the Companies agree that PV for off-grid applications is feasible, and small wind turbines may be feasible and viable in Hawaii. However, most renewable energy resources are not commercially available, not economically viable, not generating electricity at the customer site,

1 and are site specific.

2 Q. Does this mean that renewable energy can not be developed in Hawaii?

3 A. No. There are a number of other vehicles for commercial renewable energy
4 development besides this DG docket: independent power production through a
5 PPA; RHI passive, equity investment that can lead to a PPA; IRP evaluation and
6 integration process; or customer installed. In addition, there are a number of
7 policies and incentives for renewable energy development: federal and state
8 government tax credits (to help buy-down the cost of renewable technologies) and
9 state laws such as net energy metering and renewable portfolio standards (to help
10 stimulate renewable development).

11

12 SUMMARY AND UPDATE OF POLICIES AND INCENTIVES
13 FOR RENEWABLE ENERGY DEVELOPMENT

14 Q. Can you summarize your HECO T-2 testimony on policies and incentives for
15 renewable energy development in Hawaii?

16 A. Yes. The policies and state incentives for renewable energy are:

- 17 • The state energy policy has four objectives: dependable, efficient, and
18 economical statewide energy systems capable of supporting the needs of the
19 people; increased energy self-sufficiency where the ratio of indigenous to
20 imported energy use is increased; greater energy security in the face of threats
21 to Hawaii's energy supplies and systems; and reduction, avoidance, or
22 sequestration of greenhouse gas emissions from energy supply and use;
- 23 • Two state laws have recently been revised to help encourage renewable energy
24 development in Hawaii -- net energy metering ("NEM", Hawaii Revised
25 Statutes, Chapter 269, 101 to 111) and renewable portfolio standards ("RPS",

1 Hawaii Revised Statutes, Chapter 269, 91 to 94); and

2 • State and federal renewable tax credits and federal renewable research grants
3 also are available.

4 Q. Have there been any updates since your HECO T-2 testimony?

5 A. Yes. Congress has passed two bills that extend and expand the renewable energy
6 production tax credit. President Bush has signed one bill and, as of the date of this
7 testimony, is expected to sign the other.

8 Q. Can you summarize the bills passed by Congress?

9 A. President Bush has signed House Resolution 1308, which extends the sunset date
10 of the 1.8 cents/kWh federal production tax credit ("PTC") for wind energy,
11 closed-loop biomass, and qualified poultry waste facilities to December 31, 2005.
12 As of the date of this testimony, the other bill, House Resolution 4520, has yet to
13 be signed into law. If signed, House Resolution 4520 would keep the December
14 31, 2005 sunset date and implement the following key modifications related to
15 renewable energy:

- 16 • Expand the list of eligible facilities to include open-loop biomass (such as
17 agricultural waste, wood waste, and agricultural livestock waste nutrients),
18 geothermal energy, solar energy, small irrigation power, municipal solid waste
19 (landfill gas and trash combustion facilities), and refined coal;
20 • Wind energy, closed-loop biomass, and qualified poultry waste facilities are
21 allowed to claim the PTC for 10 years. However, open-loop biomass,
22 geothermal energy, solar energy, small irrigation power, and municipal solid
23 waste (landfill gas and trash combustion facilities) may claim the PTC for 5
24 years. In addition, the allowable PTC amount is reduced by one half; and
25 • For all qualifying facilities (other than closed-loop biomass facilities modified

1 to co-fire with coal or other biomass), any reduction in the PTC by reason of
2 grants, tax-exempt bonds, subsidized energy financing, or other credits cannot
3 exceed 50%. For closed-loop biomass facilities modified to co-fire with coal
4 or other biomass, there is no reduction of the PTC.

5
6 CONCLUDING COMMENTS

7 Q. What are the main conclusions from your testimony?

- 8 1) Many renewable energy resources are not commercially available, not
9 economically viable, not generating electricity at the customer site, and are
10 site specific; and
11 2) PV for off-grid applications is feasible and small wind may be feasible and
12 viable in Hawaii. As the renewable energy technologies improve and cost is
13 reduced, they may increase in their application for DG renewable energy.

14 Q. Do you have additional closing comments?

15 A. Yes. The following is a summary of my closing comments:

- 16 1) HECO, HELCO and MECO have in the past, and will continue in the future,
17 to support the increased use of renewable energy resources to meet Hawaii's
18 energy needs. Exhibit-201 from my HECO T-2 testimony summarizes the
19 strategies to increase renewable use in Hawaii; and
20 2) There are number of other vehicles for commercial renewable energy
21 development besides this DG docket: independent power production
22 through a PPA; RHI passive, equity investment that can lead to a PPA; the
23 IRP evaluation and integration process; or customer installed.
24 3) There are a number of policies and incentives for renewable energy
25 development: federal and state government tax credits (to help buy-down

1 the cost of renewable technologies) and state laws such as net energy
2 metering and renewable portfolio standards (to help stimulate renewable
3 development).

4 Q. Does this conclude your testimony?

5 A. Yes it does.

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25